

Listing of the Claims:

1. (Currently amended) A direction finding system comprising:
 - a) a plurality of antennas;
 - b) means for determining individual antenna signal strengths of signals received by each of the plurality of antennas;
 - c) combining means for deriving combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relative to signals in the other set; and
 - d) means for determining at least one emitter bearing from using the individual and combined antenna signal strengths measured.
2. (Previously presented) A direction finding system according to Claim 1 wherein the means for determining emitter bearing is arranged to derive covariance matrix elements from antenna signal strengths and to determine emitter bearing therefrom.
3. (Previously presented) A direction finding system according to Claim 1 wherein the means for determining emitter bearing is arranged to derive a relationship between antenna signal strengths and emitter bearing and to determine emitter bearing therefrom.
4. (Previously presented) A direction finding system according to Claim 1 wherein the relative phase difference is in the range 30 to 120 degrees, and the means for determining individual antenna signal strengths and the combining means are arranged to enable successive signal strengths to be derived in successive steps.
5. (Previously presented) A direction finding system according to Claim 1 wherein the relative phase difference is substantially 90 degrees.
6. (Previously presented) A direction finding system according to Claim 5 wherein the combining means is arranged to combine antenna signals with equal gain magnitude and with equal and unequal phase.

7. (Previously presented) A direction finding system according to Claim 1 wherein the combining means incorporates phase shifting means switchable into and out of an antenna signal path.
8. (Previously presented) A direction finding system according to Claim 1 wherein the combining means incorporates an adder having two inputs both switchably connected to individual signal paths extending to respective antennas.
9. (Currently amended) A direction finding system ~~according to Claim 1~~ wherein comprising:
 - a) a plurality of antennas;
 - b) the means for determining individual antenna signal strengths, the means for determining individual antenna signal strengths ~~comprises~~comprising a first multipole switch having input poles connected to receive signals from respective antennas;
 - c) combining means for deriving combined antenna signal strengths by forming combinations of a first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relative to signals in the other set, the combining means ~~incorporates~~ incorporating a second multipole switch having input poles connected to receive signals from respective antennas and a third multipole switch for switching phase shifting means into and out of an antenna signal path extending via the second multipole switch; and
 - d) the combining means also ~~incorporates~~ incorporating adding means for combining signals, the adding means being arranged to add an antenna signal in a first signal path extending via the first multipole switch to another antenna signal in a second signal path extending via the second and third multipole switches; and
 - e) means for determining at least one emitter bearing from antenna signal strengths.
10. (Currently amended) A method of direction finding using a plurality of antennas comprising the steps of determining:

- a) individual antenna signal strengths of signals received by each of the plurality of antennas;
- b) combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relative to signals in the other set; and
- c) at least one emitter bearing from using the individual and combined antenna signal strengths measured.

11. (Previously presented) A method according to Claim 10 wherein the step of determining emitter bearing is implemented by deriving covariance matrix elements from antenna signal strengths and determining emitter bearing therefrom.

12. (Previously presented) A method according to Claim 10 wherein the step of determining emitter bearing is implemented by deriving a relationship between antenna signal strengths and emitter bearing and determining emitter bearing therefrom.

13. (Previously presented) A method according to Claim 10 wherein the relative phase difference is in the range 30 to 120 degrees and successive signal strengths are determined in successive steps.

14. (Previously presented) A method according to Claim 13 wherein the relative phase difference is substantially 90 degrees.

15. (Previously presented) A method according to Claim 10 wherein the step of forming combined antenna signal strengths combines antenna signals with equal gain magnitude and with equal and unequal phase.

16. (Previously presented) A method according to Claim 12 wherein the step of forming combined antenna signal strengths includes switching a phase shift into and out of an antenna signal path.

17. (Previously presented) A method according to Claim 12 wherein the step of forming combined antenna signal strengths includes adding signals in signal paths extending switchably to different antennas.
18. (Currently amended) A method according to Claim 10 wherein of direction finding using a plurality of antennas comprising the steps of determining:
 - a) the step of determining individual antenna signal strengths; comprises switching signals from antennas via a first path; and
 - b) combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relating to signals in the other set; and
 - b) c) at least one emitter bearing from the antenna signal strengths, wherein step a) comprises switching signals from antennas via a first path; and the step b) of forming combined antenna signal strengths incorporates:
 - i) switching signals from antennas via a first path for combining;
 - ii) switching signals from antennas via a switch selectable second path or a third path for combining, the third path being arranged to phase shift antenna signals therein relative to antenna signals in the second path; and
 - iii) adding a first path antenna signal to second and third path antenna signals individually.
19. (Currently amended) A method according to Claim 11 wherein of direction finding using a plurality of antennas comprising the steps of determining:
 - a) the step of determining individual antenna signal strengths comprises by switching signals from the antennas via a first path; and
 - b) combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relating to signals in the other set; and

b) c) covariance matrix elements using the individual and combined antenna signal strengths measured, and determining at least one emitter bearing therefrom; wherein the step of forming combined antenna signal strengths incorporates:

- i) switching signals from antennas via a first path for combining;
- ii) switching signals from antennas via a switch selectable second path or a third path for combining, the third path being arranged to phase shift antenna signals therein relative to antenna signals in the second path; and
- iii) adding a first path antenna signal to second and third path antenna signals individually.

20. (Currently amended) A direction finding system incorporating:

- a) a plurality of antennas;
- b) measuring apparatus for determining individual antenna signal strengths of signals received by each of the plurality of antennas;
- c) a combining circuit for deriving combined antenna signal strengths by forming combinations of first and second antenna signals derived from different antennas, wherein the second antenna signals are in two sets with signals in one set having a non-zero phase difference relative to signals in the other set; and
- d) digital signal processing apparatus for determining at least one emitter bearing from using the individual and combined antenna signal strengths measured.